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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/747,657	12/30/2003	Byoung Kee Kim	1315-050	1579

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EXAMINER
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MAI, NGOCLAN THI

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 01/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/747,657

Applicant(s)

KIM ET AL.

Examiner

Ngoclan T. Mai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,7 and 10-19 is/are pending in the application.
- 4a) Of the above claim(s) 18 and 19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,7,10-12 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 13 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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### **DETAILED ACTION**

1. Claims 1, 3, 4, 7, 10-19 are pending. Claims 18-19 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03. Upon further consideration the claims are rejected as follows.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### ***Claim Rejections - 35 USC § 112***

3. Claim 17 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The recitation "the steps are performed without ball-milling" in the claim introduces new matter because paragraphs [27], [33], [39] and [43] of applicant's specification all disclose ball-milling.

#### ***Claim Rejections - 35 USC § 103***

4. Claims 1, 3-4, 7, 10-12, 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (U.S. Patent No. 6,293,989, now Kim)

Kim teaches a method for making cemented carbide comprising:

- (a) spray-drying of a water solution of salts containing W, Ti, and Co for producing initial powder,
- (b) preliminary heat treatment of the initial powder to remove the hygroscopic components and moisture contained in the initial powder after spray-drying,
- (c) ball-milling in order to grind the oxide powder and mix it homogeneously with an addition of carbon, and

(d) Heating the powder after milling in an atmosphere of reductive or non-oxidative gas for reduction and carburization. See abstract and col. 2, line 24 to col. 3, line 13. Note that the preliminary heat treatment is equivalent to applicant's calcining step, which remove the salt to form metal oxides.

While Kim does not specify employing carbon particles in nanosized range, Kim teaches that in the ball-milling of the powder mixture, oxide powder were ground to ultra fine size without any phase change and mixed with carbon, which were penetrated into the pores of the oxide powder, see col. 4, lines 14-23. Note that this indicates that carbon particles must be very small in order to penetrate the pores of the oxide powder. Since ultra fine powder is conventional known as powder having submicron size, i.e. less than 1 micron, the carbon particles used are expected to be much smaller than 1 micron in size in order to penetrate the pore of submicron particles. Thus carbon particles used by Kim et al. are expected to be in nanosized range. Regarding step (d) above Kim teaches that heating the ball-milled powder mixture in an atmosphere of reductive or non-oxidative gas at the temperature of 1000 deg. C ore more to convert the metal oxide to metal carbide, see col. 4, lines 25-33 and that the process of reduction of oxide particles was carried on together with the process of carburization, col. 4, lines 50-51.

The heating step (d) disclosed by Kim reads on the claimed reduction because the balled milled powder mixture is heated to a temperature of 1000 C or higher. As for the reduction and carburization step, since Kim teaches these are carried out simultaneously, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the reduction and carburization at the temperature higher than 1000 C because it is known in the art that employing higher temperature would speed up the reduction and carburization processes. Determination of an optimum or preferred temperature to obtain the desire final product would have been obvious.

As for claims 3 and 7 Kim teaches this these limitation in col. 1 , lines 30-34.

Regarding claim 4, Kim teaches the heat treating should not be less than 200 deg. C, see col. 3, lines 63-67. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to heat treating the spray dried salt mixture taught by Kim at temperature higher than 200

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deg C. Determination of an optimum or workable range of temperature by routine experimentation would have been obvious.

As for claims 10 and 11, Kim discloses titanium salt is  $TiCl_3$  and Co is the transition metal, see col. 3, lines 42-49.

As for claim 12, Kim teaches the claimed limitation in col. 4, lines 55-57.

Regarding claims 15-16, Kim teaches Co as a binder can be present in the amount of 5 to 15 wt%, col. 1, lines 33-34.

5. Claims 13-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

6. Since the above office action could have been made final from the office action and Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoclan T. Mai whose telephone number is (571) 272-1246. The examiner can normally be reached on 9:30-6:00 PM Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Ngoclan T. Mai  
Primary Examiner  
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n.m.